

CLAIMS

What is claimed is:

1. An optically responsive element capable of altering incident light characterized in that it comprises one or more transparent, paramagnetic elements that are responsive to a magnetic field and a means for providing the magnetic field, the one or more transparent, paramagnetic elements comprising in whole or part a transparent, paramagnetic polymer composition comprising a polymer complexed with a sufficient amount of one or more rare earth ions selected from the group consisting of elements 10 64 – 69 to provide a polymer composition magnetic mass susceptibility of greater than 20×10^{-6} emu/g measured at 298°K.
2. The optically responsive element of claim 1 wherein the rare earth ions are selected from the group consisting of elements 66-67.
3. The optically responsive element of claim 1 or 2 comprising an optical switch for use in optical fiber communication systems comprising:
- (a) a solid article capable of moving into and out of a path of incident light such that when the solid article is moved into the initial path of incident light, the incident light passing through the solid article is redirected to a different path; and
- (b) 25 a source of magnetic field to move the solid article into and out of the path of incident light.
4. The optically responsive element of claim 1 or 2 comprising an optical switch for use in optical fiber communication systems comprising:
- (a) 30 an input optical fiber for transmitting an incoming light signal wherein the optical fiber comprises the composition of one or more transparent, paramagnetic polymers that have a magnetic mass susceptibility of greater than 20×10^{-6} emu/g measured at 298°K;
- (b) 35 one or more output optical fibers ; and
- (c) one or more sources of magnetic field to move the first optical fiber to align with one of the output optical fibers.

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- 5 5. The optically responsive element of claim 1 wherein the polymer from which the transparent, paramagnetic polymer is made is a non-ethylene containing polymer.
6. The optically responsive element of claim 3 wherein the polymer from which the transparent, paramagnetic polymer is made is a non-ethylene containing polymer.
- 10 7. The optically responsive element of claim 4 wherein the polymer from which the transparent, paramagnetic polymer is made is a non-ethylene containing polymer.